NATIONAL CENTRE OF EXCELLENCE IN ANALYTICAL CHEMISTRY,

University of Sindh, Jamshoro

www.ceacsu.edu.pk

Annual Report (Annexure) for the Period of

1st January 2022 – 31st December 2022

Introduction to NCEAC

The National Centre of Excellence in Analytical Chemistry (NCEAC), University of Sindh, Jamshoro was established by the Government of Pakistan, Ministry of Education under Parliament Act No. IX of 1976. The administration of NCEAC is supervised by a 'Board of Governors' (BoG) comprising of 'Eminent Scientists', 'Representatives of Federal Government' and, Worthy Vice Chancellor, University of Sindh, as its Chairman. The establishment of NCEAC has proved to be a milestone in R & D struggles and a long awaiting demand of the people of Pakistan to have an *institution* of elegant repute to educate and provide training to the people of Pakistan in the professional fields of 'Modern Analytical Sciences' and particularly in 'Analytical Chemistry. Significantly, NCEAC has emerged as a strong institution of higher learning at par with other prestigious R & D institutions; because, analytical chemistry represents a vast field of research opportunities. At the NCEAC, researchers work constantly, to develop and refine methods for environmental analysis and remediation, bio-analysis, computational analysis and more. Research projects vary in magnitude and complexity, but typically a project involves a handful of people, often with different and complementary specialties.

The Centre is entrusted with the main task of establishing research facilities in Analytical Chemistry leading to M.Phil and Ph.D. degrees. Other regular academic errands of the Centre include;

In-Service training programs.

International Symposium on Analytical and Environmental Chemistry.

International Seminars/ conferences on Analytical Sciences.

Workshops mainly targeting skill development.

Assistance to the local Industries.

Faculty development programs

The Centre also plays its leading role to boost-up the research activities in various departments of Sindh University and other universities in Pakistan, as well as maintains sustainable U-I linkages by helping industries through testing and training.

PROGRESS SUMMARY

1st January 2022 – 31st December 2022

During 2022, total 06 Ph.D. and 19 M.Phil. Research Scholars of the Center were awarded degrees of Ph.D. and M. Phil., respectively by the University of Sindh. The total number of international publications (listed in this report) is 87 in internationally recognized Journals and 08 Book Chapters. Beside this, 01 project was won by the faculty under funding program by Sindh HEC. This Center has developed academic linkages with various international universities/institutions, e.g. Middle East Technical University, Turkey, Selçuk University, Konya, Turkey, Hacettepe University, Ankara, Turkey and Charles University, Prague, Czech Republic and Wake Forest University, Winston-Salem, USA. As a result of all these efforts this Centre is now being recognized internationally and a significant number of Scholars of this Centre visited the different institutions as visiting researchers during and after Ph.D. The Centre has thus contributed significantly in raising the academic ranking of the University of Sindh, Jamshoro. The detailed report is given below.

FACULTY STRENGTH

1. **Prof. Dr. Tufail Hussain Sheerazi, Ph.D. (SU), Postdoc. (Canada)**
   DIRECTOR

2. **Prof. Dr. Najma Memon, Ph.D. (SU), Postdoc. (USA)**
3. **Prof. Dr. Amber Rehana Solangi, Ph.D. (SU), Postdoc. (Australia)**
4. **Prof. Dr. Farah Naz Talpur, Ph.D. (SU), Postdoc. (Turkey)**
5. **Associate Prof. Dr. Hassan Imran Afridi, Ph.D. (SU), Postdoc. (Ireland)**
6. **Associate Prof. Dr. Sarfaraz Ahmed Mahesar, Ph.D. (SU), Postdoc. (Turkey)**
7. **Associate Prof. Dr. Aamna Baloch, Ph.D. (SU) Postdoc. (Malaysia)**
8. **Associate Prof. Dr. Jameel Ahmed Baig Mughal, Ph.D. (SU), Postdoc. (Turkey)**
9. **Associate Prof. Dr. Ayaz Ali Memon, Ph.D. (SU)**
10. **Assistant Prof. Dr. Huma Ishaque Shaikh, Ph.D. (SU)**

ENROLLEMENT OF M.PHIL SCHOLARS IN 2022

In the year 2022 National Center of Excellence in Analytical Chemistry Enrolled 15 M.Phil Scholars for the Batch 2022-23. They are pursuing M.Phil Coarse Work and have successfully taken their 1st Term Semester Examinations.

S.No.	Name of Scholar
1.	Abbas Aziz Rajput
2.	Amna Vighio
3.	Asim Shahzad Mahesar
4.	Erum Fazlani
5.	Haresh Kumar Bheel
6.	Kainat Malik
7.	Kissa E Zehra Taqvi Syed
8.	Manaza Kamboh
9.	Muhammad Ahmed Chang
10.	Nahal Fatima Solangi
11.	Preh Bhanhbhro
12.	Qurratulain Sayed
13.	Salman Khan Channar
14.	Sana Machhi
15.	Sana Ul Nisa Lanjar

ENROLLEMENT OF PH.D SCHOLARS IN 2022

In the year 2022 National Center of Excellence in Analytical Chemistry Enrolled 17 Ph.D Scholars for the Batch 2022-23. They are pursuing Ph.D Coarse Work and have successfully taken their 1st Term Semester Examinations.

S.No.	Name
1.	Bakhtawar Khair Pirzada
2.	Dahar Janwery
3.	Iram Gul Chandio
4.	Kashaf Memon
5.	Komal Shah
6.	Komal Zehra Manganhar
7.	Khalil Akhtar Laghari
8.	Mehrunnis Koondher
9.	Noshad Razzaque Jamali
10.	Sajjad Ali Chang
11.	Sanoober Bhagat
12.	Shakoor Ahmed Solangi
13.	Shazia Chohan
14.	Shazia Komal Junejo
15.	Shazia Magsi
16.	Talib Hussain Banglani
17.	Waris Nawab Panhwar

M.PHIL SCHOLARS GRADUATED IN 2022

During the year of 2022; 19 M.Phil Scholars graduated from National Center of Excellence in Analytical Chemistry, University of Sindh, Jamshoro.

S.No	Name of Scholar
1.	Mr. Waqar Ahmed
2.	Mr. Arshad Ali
3.	Ms. Komal Saraz
4.	Ms.Komal Shah
5.	Mr. Muhammad Mahboob
6.	Ms. Komal Urs
7.	Ms. Kashaf Memon
8.	Ms. Mehrunnisa Koondhar
9.	Ms. Shazia Chohan
10.	Mr. Ali Murad Baloch
11.	Ms. Sakhi
12.	Ms. Sidra Khan
13.	Mr. Muhammad Junaid
14.	Ms. Sanoober Bhagat
15.	Mr. Meer Muhammad
16.	Mr. Khalil Akhtar
17.	Mr. Shakoor Ahmed Solangi
18.	Mr. Noshad Razaq
19.	Mr. Waris Nawab

PHD SCHOLARS GRADUATED IN 2022

During the year of 2022; 05 Ph.D Scholars graduated from National Center of Excellence in Analytical Chemistry, University of Sindh, Jamshoro.

S.No	Name of Scholar
1.	Ms. Safia Sanam Memon
2.	Mr. Ranjhan Jonejo
3.	Ms. Sanam Erum Soomro
4.	Mr. Abdullah
5.	Mr. Muhammad Waris Arain

Part of PHD Research/ Post Doc by Turkish Fellowship Grants

During the current period the following Research Fellows of this Centre were granted scholarship for 9 Months by "Türkiye Scholarship Bursalari". They have successfully completed their research in different Universities of Turkey.

S.NO.	Name of Research Fellow
1.	Mr. Abdul Waris
2.	Ms. Hadia Shoaib
3.	Ms. Sidra Mahesar
4.	Ms. Zaib un Nisa
5.	Ms. Roomia Memon
6.	Ms. Suraya Samaijo
7.	Ms. Tania

COURSE WORK

- **Details of Courses taught to M. Phil.**

Code	Course Title	CH	Teachers
1st Semester *(from July to Dec)*			
CHEM-701	Atomic Spectroscopy	2	*Dr. Hassan Imran Afridi*
CHEM-702	Molecular Spectroscopy	2	*Dr. Sarfaraz Ahmed Mahesar* *Dr. Ayaz Ali Memon*
CHEM-716	Mass Spectrometry	2	*Prof. Shahabuddin Memon* *Dr. Huma Shaikh*
CHEM-703	NMR Spectroscopy	1	*Prof. Dr. Syed Tufail Hussain Sherazi*
CHEM-704	Electroanalytical Techniques	2	*Dr.Amber R. Solangi*
CHEM-705	Chemometrics	2	*Dr. Hassan Imran Afridi,* *Dr. Aamna Balauch*
CHEM-706	Lab Work, Computer Lab	N.C	*Dr. Ayaz Memon*
CHEM-707	Environmental Chemistry	2	*Dr. Najma Memon*
CHEM-708	Chemical Safety	1	*Dr. Huma Ishaque Shaikh*
CHEM-751	Chromatographic Techniques	2	*Dr. Najma Memon* *Dr.Farah Naz Talpur*
Sub-Total		**16**	
2nd Semester *(from Jan to June)*			
CHEM-752	Nanotechnology/Biosensors	2	*Prof. Amber R. Solangi*
CHEM-753	Chemometrics-II	1	*Dr. Hassan Imran Afridi* *Dr. Jameel Ahmed Baig*
CHEM-723	Material Chemistry	2	*Prof. Shahabuddin Memon* *Dr. Huma Shaikh*
CHEM-755	Electronics & Chemical Instrumentation	1	*Dr. Sarfaraz Ahmed Mahesar* *Dr. Ayaz Ali Memon*
CHEM-756	Environmental Analytical Chemistry	1	*Dr. Amber R. Solangi*
CHEM-758	Thermal Methods	1	*Dr. Farah Naz Talpur*
CHEM-759	Scientific Writing in Analytical Chemistry	N.C	*Prof. Dr.Najma Memon*
	Sub-Total	**08**	
	Courses-Total	**24**	

- **Details of Courses Taught to Ph.D.**

Code	Course Title	CH	Teacher
1st Semester			
CHEM-900	Supramolecular Chemistry	2	*Prof. Shahabuddin Memon,* *Dr. Huma Ishaque Shaikh*
CHEM-901	Special Topics	1	*Concerned Supervisor*
CHEM-902	Food Analytical Chemistry	2	*Prof. T. G. Kazi, Dr. Farah Naz,* *Dr. Najma Memon, Dr. Sarfaraz Ahmed Mahesar*
CHEM-903	Advanced Chromatographic Techniques	2	*Dr. Najma Memon*
CHEM-904	Bioanalytical Chemistry	2	*Prof. T. G. Kazi,* *Dr. Farah Naz*
Sub-Total		**9**	
2nd Semester			
CHEM-905	Forensic Analytical Chemistry	2	*Dr. Najma Memon*
CHEM-906	Advances in Analytical Spectroscopy	2	*Dr. Sarfaraz Ahmed Mahesar* *Dr. Ayaz Ali Memon*
CHEM-907	Advanced Electroanalytical Techniques	1	*Prof. Dr. Amber R.Solangi*
CHEM-908	Surface Characterization Techniques	2	*Prof. Dr. Amber R. Solangi*
CHEM-909	Green Analytical Chemistry	1	*Dr. Aamna Balouch*
CHEM-910	Chemoinformatics	1	*Dr. Hassan Imran Afridi* *Dr. Jameel Ahmed Baig*
	Sub-Total	**9**	
	Courses-Total	**18**	

LIST OF RESEARCH PAPERS PUBLISHED IN NATIONAL/INTERNATIONAL JOURNALS DURING 2022

[1] F. Abbasi, A.A. Lashari, I.B. Solangi, J.A. Baig, T.G. Kazi, H.I. Afridi, Simultaneous quantification of essential and toxic elements from mangoes fruit and its juices, International Journal of Environmental Analytical Chemistry, (2022) 1-7.

[2] Abdul Hammed Kori, Sarfaraz Ahmed Mahesar, Abdul Rauf Khaskheli, Syed Tufail Hussain Sherazi, Zahid Husain Laghari, Tarique Panhwar, Aijaz Ali Otho, Effect of Wall Material and Inlet Drying Temperature on Microencapsulation and Oxidative Stability of Pomegranate Seed Oil Using Spray Drying, Journal of Oleo Science, 71 (2022) 31-41.

[3] Abdul Rauf Shaikh, Ghulam Qadir Shar, Aamna Balouch, Fabrication of silica tagged magnetic nano-catalyst for the degradation of Rhodamin-B dye, Journal of Chemical society of Pakistan, 44 (2022).

[4] G.Q.S. Abdul Rauf Shaikh, Aamna Balouch, , Preparation of Silica Coated Tin Oxide Nano-Catalyst as an Efficient Applicant for Catalytic Degradation of Eosin-Y Dye, Turkish Journal of Physiotherapy and Rehabilitation, 32 (2022).

[5] N.Q. Abro, N. Memon, B.A. Samejo, M.R. Halepoto, A.A. Hakro, Characterization and capacitive performance assessment of potato peels derived salt-induced porous carbons, Biomass Conversion and Biorefinery, (2022).

[6] R. Abro, Q.K. Panhwar, H.I. Afridi, F.N. Talpur, G.Q. Chanihoon, Interaction between Selenium and Mercury in Biological Samples of Head and Neck Cancer Patients, Clin Lab, 68 (2022).

[7] A. Akhtar, T.G. Kazi, H.I. Afridi, M. Khan, Human exposure to toxic elements through facial cosmetic products: Dermal risk assessment, Regulatory Toxicology and Pharmacology, 131 (2022) 105145.

[8] A. Akhtar, T.G. Kazi, H.I. Afridi, S.G. Musharraf, M.B. Arain, J.A. Baig, Determination of Mercury in Artificial Saliva Extract of Chewing Tobacco by Dispersive Liquid–Liquid Micro-Extraction Using Electrothermal Atomic Absorption Spectrometry (ETAAS), Analytical Letters, 55 (2022) 2185-2198.

[9] K. Akhtar, J. Ahmed Baig, T. Gul Kazi, Sirajuddin, H. Imran Afridi, F. Naz Talpur, I. Bakhsh Solangi, S. Samaijo, Novel fluoride selective voltammetric sensing method by amino phenylboronic acid-zirconium oxide nanoparticles modified gold electrode, Microchemical Journal, 174 (2022) 107073.

[10] A.Y. Al-She'irey, A. Balouch, E.R. Mawarnis, L. Roza, M.Y.A. Rahman, Abdullah, A.M. Mahar, Effect of ZnO seed layer annealing temperature on the growth of ZnO nanorods and its catalytic application, Optical Materials, 131 (2022) 112652.

[11] I.S. Arain, M.A. Mughal, A. Balouch, N.L. Rajput, N. Channa, S. Qaimkhani, S. Arain, S.H. Bughio, N.N. Memon, Preparation of MgO@SiO2 encapsulated polymethylene bis (pyrrole-2-carboxaldehyde)o-phenylenediimine: applied as efficient adsorbent for Cu (II) ions from aqueous system, International Journal of Environmental Analytical Chemistry, 102 (2022) 159-173.

[12] M.W. Ashraf, S.I. Haider, A.R. Solangi, A.F. Memon, Toxicity of tellurium and its compounds, (2022).

[13] Atif S, Baig JA, Afridi HI, Waris M, Asif W, N. A, Analytical Comparison of Cefadroxil Determination by Square Wave Adsorptive Stripping Voltammetric and Spectrophotometric Methods, Austin J Anal Pharm Chem, 9 (2022).

[14] J.A. Baig, I.G. Chandio, T.G. Kazi, H.I. Afridi, K. Akhtar, M. Junaid, S. Naher, S.A. Solangi, N.A. Malghani, Risk Assessment of Macronutrients and Minerals by Processed, Street, and Restaurant Traditional Pakistani Foods: a Case Study, Biological Trace Element Research, (2022).

[15] J.A. Baig, M. Muhammad, K. Akhtar, H.I. Afridi, T.G. Kazi, J. Mirza, S.A. Solangi, A.A. Bhutto, Selective electrochemical sensing of cefixime by silver nanoparticle amalgam paste microelectrode, Journal of Materials Science: Materials in Electronics, 33 (2022) 13926-13938.

[16] H. Bakhsh, I.M. Palabiyik, R. Kumar Oad, N. Qambrani, J.A. Buledi, A.R. Solangi, S. Tufail H. Sherazi, SnO2 nanostructure based electroanalytical approach for simultaneous monitoring of vitamin C and vitamin B6 in pharmaceuticals, Journal of Electroanalytical Chemistry, 910 (2022) 116181.

[17] S.G. Baloch, H. Shaikh, S. Shah, S. Memon, A.A. Memon, Synthesis of an insulin intercalated graphene oxide nanogel composite: evaluation of its release profile and stability for oral delivery of insulin, Nanoscale Advances, 4 (2022) 2303-2312.

[18] A. Balouch, M.S. Jagirani, E. Alveroglu, S. Lal, Sirajuddin, A.M. Mahar, D. Mal, Ultra-Fast Degradation of Thymol Blue Dye Under Microwave Irradiation Technique Using Alpha-orthorhombic Molybdenum Trioxide (α-MoO3) Colloidal Nanoparticles, Journal of Cluster Science, (2022).

[19] M. Batool, Z. Afzal, H.M. Junaid, A.R. Solangi, A. Hassan, Sulfonamides as Optical Chemosensors, Critical Reviews in Analytical Chemistry, (2022) 1-28.

[20] A.A. Bhutto, J.A. Baig, Sirajuddin, T.G. Kazi, R. Sierra-Alvarez, K. Akhtar, S. Hussain, H.I. Afridi, A. Hol, S. Samejo, Biosynthesis and Analytical Characterization of Iron Oxide Nanobiocomposite for In-Depth Adsorption Strategy for the Removal of Toxic Metals from Drinking Water, Arabian Journal for Science and Engineering, (2022).

[21] J.A. Buledi, N. Mahar, A. Mallah, A.R. Solangi, I.M. Palabiyik, N. Qambrani, F. Karimi, Y. Vasseghian, H. Karimi-Maleh, Electrochemical quantification of mancozeb through tungsten oxide/reduced graphene oxide nanocomposite: A potential method for environmental remediation, Food and Chemical Toxicology, 161 (2022) 112843.

[22] J.A. Buledi, A.R. Solangi, A. Hyder, N.H. Khand, S.A. Memon, A. Mallah, N. Mahar, E.N. Dragoi, P. Show, M. Behzadpour, H. Karimi-Maleh, Selective oxidation of amaranth dye in soft drinks through tin oxide decorated reduced graphene oxide nanocomposite based electrochemical sensor, Food and Chemical Toxicology, 165 (2022) 113177.

[23] J.J.A. Buledi, A.R. Solangi, A. Hyder, M. Batool, N. Mahar, A. Mallah, H. Karimi-Maleh, O. Karaman, C. Karaman, M. Ghalkhani, Fabrication of sensor based on polyvinyl alcohol functionalized tungsten oxide/reduced graphene oxide nanocomposite for electrochemical monitoring of 4-aminophenol, Environ Res, 212 (2022) 113372.

[24] R.K. Bux, S.I. Haider, M. Batool, A.R. Solangi, S.Q. Memon, Z.-U.-H. Shah, O. Moradi, Y. Vasseghian, Natural and anthropogenic origin of metallic contamination and health risk assessment: A hydro-geochemical study of Sehwan Sharif, Pakistan, Chemosphere, 300 (2022) 134611.

[25] R.K. Bux, S.I. Haider, M. Batool, A.R. Solangi, Z. Shah, H. Karimi-Maleh, F. Sen, Assessment of heavy metal contamination and its sources in urban soils of district Hyderabad, Pakistan using GIS and multivariate analysis, International Journal of Environmental Science and Technology, 19 (2022) 7901-7913.

[26] R.K. Bux, S.I. Haider, A. Mallah, Z.-u.-H. Shah, A.R. Solangi, O. Moradi, H. Karimi-Maleh, Spatial analysis and human health risk assessment of elements in ground water of District Hyderabad, Pakistan using ArcGIS and multivariate statistical analysis, Environmental Research, 210 (2022) 112915.

[27] A.A. Chandio, S. Memon, A.A. Memon, A. Balouch, R. Memon, K.H. Thebo, F.N. Memon, M.H. Agheem, S.S. Memon, A.A. Otho, Eco-Friendly Conversion of p-Nitrophenol into p-Aminophenol Using Calix[4]arene Derived CuO Nanoparticles: An Excellent Catalytic Agent, Polycyclic Aromatic Compounds, (2022) 1-13.

[28] F. Chang, N. Memon, S. Memon, A.J.I.J.o.E.S. Chang, Technology, Selective adsorption of emerging contaminants from aqueous solution using Cu-based composite by solvothermal, (2022) 1-8.

[29] G.Q. Chanihoon, H.I. Afridi, F.N. Talpur, T.G. Kazi, J.A. Baig, Interaction Between Essential (Zn) and Toxic (Cd) Elements in Different Stages of Female Breast Cancer Patients, Resident in Different Cities of Sindh, Pakistan, Biological Trace Element Research, 200 (2022) 1117-1126.

[30] G.Q. Chanihoon, H.I. Afridi, A. Unar, F.N. Talpur, H.B. Kalochi, R. Nassani, N. Laghari, N. Uddin, A. Ghulam, A.U.R. Chandio, Selenium and mercury concentrations in biological samples from patients with COVID-19, Journal of trace elements in medicine and biology : organ of the Society for Minerals and Trace Elements (GMS), 73 (2022) 127038.

[31] G.Q. Chanihoon, Z. Khalid, H.I. Afridi, T.H. Jafar, A.A. Nassani, A. Unar, M. Haffar, Determining the level of essential elements in patients with Ewing Sarcoma: A correlation, Environmental Research, 211 (2022) 113035.

[32] G.-Q. Chanihoon, A. Unar, A.-A. Memon, H.-I. Afridi, A.-u.-R. Chandio, T.-H. Jafar, Determination of enzyme Q10 level in Pakistani female patients with breast cancer, Chinese Journal of Analytical Chemistry, 50 (2022) 100061.

[33] M.K. Channa, K. Akhtar, J.A. Baig, T.G. Kazi, H.I. Afridi, S. Perveen, S.A. Solangi, B. Sara, Distribution of chromium species and physico-chemical analysis of different industrial effluents in Sindh, Pakistan., Journal of the Turkish Chemical Society Section A: Chemistry, (2022) 1-10.

[34] G. Fareed, J.A. Baig, T.G. Kazi, H.I. Afridi, K. Akhtar, I.B. Solangi, Heavy metals contamination levels in the products of sugar industry along with their impact from sugar to the end users, International Journal of Environmental Analytical Chemistry, (2022) 1-10.

[35] S. Gul, F.N. Memon, S.J.N.J.o.C. Memon, Optimization of toxic metal adsorption on DEA-calix [4] arene appended silica resin using a central composite design, 46 (2022) 3448-3463.

[36] Hadia Shoaib, Syed Tufail Hussain Sherazi, Saba Naz, Sarfaraz Ahmed Mahesar, Abdul Rauf Khaskheli, Siraj Uddin, Ahmed Raza Sidhu, Hamide Filiz Ayyildiz, Hüseyin Kara, M. Topkafa, Chromatographic Evaluation Of Tocols And Sterols Of Processed Canola Oil And Deodorizer Distillate, Turkish Journal Chemistry, 46 (2022) 302-310.

[37] S. Hussain, I. Sadiq, J.A. Baig, F. Sadiq, M. Shahbaz, I.B. Solangi, M. Idrees, S. Saeed, S. Riaz, S. Naseem, Synthesis and characterization of vanadium ferrites, electrochemical sensing of acetaminophen in biological fluids and pharmaceutical samples, Ceramics International, (2022).

[38] A. Hyder, J.A. Buledi, M. Nawaz, D.B. Rajpar, Z.-u.-H. Shah, Y. Orooji, M.L. Yola, H. Karimi-Maleh, H. Lin, A.R. Solangi, Identification of heavy metal ions from aqueous environment through gold, Silver and Copper Nanoparticles: An excellent colorimetric approach, Environmental Research, 205 (2022) 112475.

[39] Iatizaz Hassan, Naseer Ahmed Khan, Naveed Ul Hasan Syed, Najma Memon, K.M. Barki, Emissions of black plumes from the chimneys of brick making kilns; a compositional study of the blackish particulates, (2022).

[40] H. Imran Afridi, T. Gul Kazi, F. Naz Talpur, J. Ahmed Baig, G. Qadir Chanihoon, Essential trace and toxic elemental concentrations in biological samples of male adult referent and Eunuch subjects, Clinica Chimica Acta, 529 (2022) 96-103.

[41] M.S. Jagirani, A. Balouch, E. Alveroğlu, S.A. Mahesar, B. Zeytuncu, Abdullah, A.R. Khaskhali, Fabrication of Cobalt tagged smart ion-imprinted polymeric material applied for the elimination of Co2+ ions from real environmental samples, Polymer Bulletin, (2022).

[42] M.S. Jagirani, A. Balouch, S.A. Mahesar, E. Alveroğlu, A. Kumar, A. Tunio, Abdullah, Selective and sensitive detoxification of toxic lead ions from drinking water using lead (II) ion-imprinted interpenetrating polymer linkage, Polymer Bulletin, 79 (2022) 1887-1909.

[43] M.S. Jagirani, S.A. Mahesar, S. Uddin, S.T.H. Sherazi, A.H. Kori, S.A. Lakho, N.H. Kalwar, S.S. Memon, Functionalized Gold Nanoparticles Based Optical, Surface Plasmon Resonance-Based Sensor for the Direct Determination of Mitoxantrone Anti-cancer Agent from Real Samples, Journal of Cluster Science, 33 (2022) 241-247.

[44] F.A. Janjhi, D. Janwery, I. Chandio, S. Ullah, F. Rehman, A.A. Memon, J. Hakami, F. Khan, G. Boczkaj, K.H. Thebo, Recent Advances in Graphene Oxide-Based Membranes for Heavy Metal Ions Separation, n/a (2022).

[45] R. Junejo, N. Shams Jalbani, S. Kaya, G. Serdaroglu, M. Elik, S.J.S.S. Memon, Technology, Equilibrium, thermodynamic, and kinetic modeling studies for the adsorptive removal of oxyanions from water, 57 (2022) 1884-1899.

[46] R. Junejo, N. Shams Jalbani, S. Kaya, G. Serdaroglu, S. Şimşek, S.J.S.S. Memon, Technology, Experimental and DFT modeling studies for the adsorptive removal of reactive dyes from wastewater, 57 (2022) 339-353.

[47] F. Kandhro, T.G. Kazi, H.I. Afridi, J.A. Baig, Compare the nutritional status of essential minerals in milk of different cattle and humans: Estimated daily intake for children, Journal of Food Composition and Analysis, 105 (2022) 104214.

[48] A. Khatoon, N.H. Khand, A. Mallah, A.R. Solangi, S.Q. Memon, A.F. Memon, C. Karaman, F. Karimi, O. Karaman, A Fast and Reliable Electrophoretic Method for Size-Based Characterization of Silver Nanoparticles, Industrial & Engineering Chemistry Research, (2022).

[49] A. Khatoon, J.A. Syed, J.A. Buledi, S. Shakeel, A. Mallah, A.R. Solangi, Sirajuddin, S.T.H. Sherazi, M.R. Shah, Bio-green fabrication of bell pepper mediated silver nanoparticles: an efficient material for electrochemical sensing of arbutin in cosmetics, Journal of the Iranian Chemical Society, 19 (2022) 3659-3672.

[50] S. Khatri, S.T.H. Sherazi, Z. Khatri, S.A. Mahesar, Sirajuddin, F. Ahmed, A delicate approach to the determination of duloxetine hydrochloride using electrospun polyvinylidene difluoride nanofibers, Journal of the Iranian Chemical Society, 19 (2022) 2067-2074.

[51] M.-U.-N. Khilji, N.A. Nahyoon, M. Mehdi, K.H. Thebo, N. Mahar, A.A. Memon, N. Memon, N. Hussain, Synthesis of novel visible light driven MgO@GO nanocomposite photocatalyst for degradation of Rhodamine 6G, Optical Materials, 135 (2023) 113260.

[52] T.S. Khokhar, F.N. Memon, S.S. Memon, A.A. Memon, A.A. Bhatti, S. Memon, Naringenin solubilizing and pH dependent releasing properties of water soluble p-sulphonatocalix[4]arene, Supramolecular Chemistry, (2022) 1-11.

[53] A.H. Kori, S.A. Mahesar, A.R. Khaskheli, S.T.H. Sherazi, Z.H. Laghari, T. Panhwar, A.A. Otho, Effect of Wall Material and Inlet Drying Temperature on Microencapsulation and Oxidative Stability of Pomegranate Seed Oil Using Spray Drying, Journal of Oleo Science, 71 (2022) 31-41.

[54] S.H. Laghari, N. Memon, M. Yar Khuhawer, T.M. Jahangir, Fluorescent Carbon Dots and their Applications in Sensing of Small Organic Molecules, Current Analytical Chemistry, 18 (2022) 17.

[55] A.A. Lashari, T.G. Kazi, J.A. Baig, H.I. Afridi, A.-U.-R. Chandio, G.Q. Chanihoon, A. Lashari, Volatilisation of selenium from coals by heating at different temperature: application of sequential extraction scheme on ash, International Journal of Environmental Analytical Chemistry, (2022) 1-10.

[56] A.A. Lashari, T.G. Kazi, J.A. Baig, H.I. Afridi, A.A. Memon, Speciation of the Selenium in Groundwater Samples of Different Aquifers from Coal Mining Fields: Applied a Green Analytical Technique, Water, Air, & Soil Pollution, 233 (2022) 428.

[57] M. Ashraf Bajeer, Zahid Hussain Shar, Nizamuddin Solangi, Sorath Solangi, M. A. Mallah, M. Kashif Channa, S.T.H. Sherazi, Adsorption and Leaching of Deltamethrin Pesticide in Alluvial Soil Under Laboratory and Field Conditions, Pakistan Journal of Medical & Health Sciences, 16 (2022).

[58] A.M. Mahar, E. Alveroglu, A. Balouch, F.N. Talpur, Abdullah, M.S. Jagirani, Fabrication of Fe/Bi bimetallic magnetic nano-oxides (IBBMNOs) as efficient remediator for hexavalent chromium from aqueous environment, Environmental science and pollution research international, 29 (2022) 65161-65175.

[59] Z.A. Mahar, G.Q. Shar, A. Balouch, Fabrication and Catalytic Efficiency of ZnO/PVP Nanocatalysts: A Tremendous Applicant for Methyl Orange Dye Degradation in Aqueous Medium, Journal of Nano Research, 73 (2022) 121-138.

[60] D. Mal, E. Alveroglu, A. Balouch, M.S. Jagirani, Abdullah, S. Kumar, Highly efficient and selective heterogeneous catalytic reduction of 2-nitroaniline by cerium oxide nanocatalyst under microwave irradiation, Environmental Technology, 43 (2022) 3631-3645.

[61] N. Malghani, S. Mahesar, J.A. Baig, F.N. Talpur, S.T.H. Sherazi, M. Junaid, Nutritional Assessment and Proximate Analysis of Selected Vegetables Grown in Larkana, Sindh, Pakistan. , 9(4), 985-998, Journal of the Turkish Chemical Society Section A: Chemistry, 9 (2022) 985-998.

[62] A.F. Memon, S. Ameen, N.H. Khand, N. Qambrani, J.A. Buledi, B. Junejo, A.R. Solangi, S.I.H. Taqvi, E.-N. Dragoi, N. Zare, F. Karimi, Y. Vasseghian, Electrochemical monitoring of bisphenol-s through nanostructured tin oxide/Nafion/GCE: A solution to environmental pollution, Chemosphere, 303 (2022) 135170.

[63] A.F. Memon, S. Ameen, N. Qambrani, J.A. Buledi, N.H. Khand, A.R. Solangi, S.I.H. Taqvi, C. Karaman, F. Karimi, E. Afsharmanesh, An improved electrochemical sensor based on triton X-100 functionalized SnO2 nanoparticles for ultrasensitive determination of cadmium, Chemosphere, 300 (2022) 134634.

[64] S.A. Memon, H. Shaikh, S. Memon, F.K. Mahar, Z. Khatri, Diallylcalix[4]arene incorporated polystyrene nanofibers for the removal of endosulfan from an aqueous environment, Reactive and Functional Polymers, 175 (2022) 105280.

[65] S.A. Memon, H. Shaikh, R. Raza, Z.u.N. Mughal, A.A. Memon, S. Memon, Graphene incorporated mesoporous perovskite with excellent conductivity and catalytic activity for low temperature solid oxide fuel cells, New Journal of Chemistry, 46 (2022) 12530-12539.

[66] S.S. Memon, N. Memon, S. Memon, A. Lachgar, An excellent sulfonated hydrothermal carbon catalyst from Mangifera indica L. (mango peels) for biodiesel production: preparation, characterization, optimization, and kinetic study, Biomass Conversion and Biorefinery, 12 (2022) 141-151.

[67] Z.u.N. Mughal, H. Shaikh, J.A. Baig, S. Memon, Sirajuddin, S. Shah, Fabrication of an imprinted polymer based graphene oxide composite for label-free electrochemical sensing of Sus DNA, New Journal of Chemistry, 46 (2022) 16509-16522.

[68] S. Muhammad, M.N. Javed, K.A. Gill, F.I. Ali, W. Henderson, A. Bari, S.G. Musharraf, J.A. Baig, I.A. Hashmi, Selective extraction of heavy metals (Fe, Co, Ni) from their aqueous mixtures by Task-Specific salicylate functionalized imidazolium based ionic liquid, Journal of Cleaner Production, 344 (2022) 131119.

[69] M. Nawaz, H. Shaikh, J.A. Buledi, A.R. Solangi, R. Raza, B. Maher, Microwave-assisted synthesis of cadmium/reduced graphene oxide composite: an operative platform for highly specific electrochemical determination of bisphenol-A, Journal of Applied Electrochemistry, (2022).

[70] P. Nizamani, H.I. Afridi, T.G. Kazi, F.N. Talpur, J.A. Baig, Essential trace elemental levels (zinc, iron and copper) in the biological samples of smoker referent and pulmonary tuberculosis patients, Toxicology reports, 6 (2019) 1230-1239.

[71] A.A. Otho, R.A. Memon, S.A. Abro, A.A. Memon, Elemental Analysis of Medicinal Herb Fagonia indica Burm. f. and Its Rhizospheric Soil from Six Geographical Locations of South-eastern Sindh Province, Pakistan, During Spring and Summer Seasons, Biological Trace Element Research, 200 (2022) 2439-2454.

[72] S. Parveen, H. Imran Afridi, T. Gul Kazi, F.N. Talpur, J. Ahmed Baig, G. Qadir Chanihoon, A.A. Memon, A. Rahoojo, Impacts of Smoking and Stomach Disorders on Essential Elements in Biological Samples of Cement and Glass Industrial Workers, Biological Trace Element Research, (2022).

[73] N. Qambrani, J.A. Buledi, N.H. Khand, A.R. Solangi, S. Ameen, N.S. Jalbani, A. Khatoon, M.A. Taher, F.H. Moghadam, M. Shojaei, F. Karimi, Facile Synthesis of NiO/ZnO nanocomposite as an effective platform for electrochemical determination of carbamazepine, Chemosphere, 303 (2022) 135270.

[74] S. Qambrani, F.N. Talpur, A.A. Panhwar, H.I. Afridi, M.K. Talpur, A. Khan, S.A. Hab, Development of guar gum-based coating with castor oil for improved postharvest quality of fresh mangoes using response surface methodology, Applied Food Research, 2 (2022) 100220.

[75] N.L. Rajput, M.A. Mughal, A. Balouch, K.M. Khan, S.A. Tunio, Kanwal, S. Sohu, Effective photocatalytic methylene orange dye degradation ability in coloured textile contaminated water by highly efficient catalyst Schiff-based resin-encapsulated supported on TiO2@SiO2 metal oxide nanoparticles, International Journal of Environmental Analytical Chemistry, 102 (2022) 3561-3575.

[76] I.K. Rind, N. Memon, M.Y. Khuhawar, M.F. Lanjwani, Thermally activated mango peels hydrochar for fixed-bed continuous flow decontamination of Pb(II) ions from aqueous solution, International Journal of Environmental Science and Technology, 19 (2022) 2835-2850.

[77] I.K. Rind, N. Memon, M.Y. Khuhawar, W.A. Soomro, M.F. Lanjwani, Modeling of cadmium(II) removal in a fixed bed column utilizing hydrochar-derived activated carbon obtained from discarded mango peels, Scientific Reports, 12 (2022) 8001.

[78] Sadia Qamar Arain, Farah Naz Talpur, Naseem Aslam Channa, Nazakat Hussain Memon , Marvi Shaikh, U. Channa, A.H. Laghari., Altered Levels Of Serum Fatty Acid Profile Associated with Clinical Significance In Hepatitis C Cirrhosispatients, Jilin Daxue Xuebao (Gongxueban)/Journal of Jilin University (Engineering and Technology Edition), 41 (2022).

[79] Saeeda Rind, Zahid Hussain Shar, E. Khan, M. K Channa, M. Ashraf, N. Solangi, S. Solangi, H.H Shar, Om Pirkash, S.T.H Sherazi, Evaluation of aflatoxins in the oil and cake obtained from cotton seeds, International Journal of Mechanical Engineering, 7 (2022) 444-450.

[80] F. Shaikh, Q.K. Panhwar, A. Balouch, S. Ali, W.A. Panhwar, F. Sheikh, Synthesis of zinc oxide nanoparticles and their functionalisation with chrysin: exploration of its applications, International Journal of Environmental Analytical Chemistry, 102 (2022) 1662-1671.

[81] N. Shams Jalbani, A.R. Solangi, S. Memon, R. Junejo, A.A. Bhatti, Surface coating of silica with amine functionalized calix[4]arene and its application in metal ion extraction, Journal of Dispersion Science and Technology, (2022) 1-9.

[82] Sherazi Tufail Hussain Syed, Mahesar Ahmed Sarfaraz, S.a.Y. Xiuzhu, Role of Capping Agent for the Colorimetric and Fluorescent Sensing of Different Materials Using Metal Nanoparticles, 2022; 18(2) . https://dx.doi.org/10.2174/1573411017666210617092818, Current Analytical Chemistry, 18 (2022) 1-10.

[83] A.N. Soomro, H. Shaikh, M.I. Malik, J.A. Buledi, S. Qazi, A. Solangi, Fluorene intercalated graphene oxide based CoQ10 imprinted polymer composite as a selective platform for electrochemical sensing of CoQ10, RSC Advances, 12 (2022) 31639-31649.

[84] S.I.H. Taqvi, A.R. Solangi, J.A. Buledi, N.H. Khand, B. Junejo, A.F. Memon, S. Ameen, A. Bhatti, P.-L. Show, Y. Vasseghian, H. Karimi-Maleh, Plant extract-based green fabrication of nickel ferrite (NiFe2O4) nanoparticles: An operative platform for non-enzymatic determination of pentachlorophenol, Chemosphere, 294 (2022) 133760.

[85] M. Waris, J.A. Baig, F.N. Talpur, H.I. Afridi, T.G. Kazi, H. Yousaf, Evaluation of selected halophytes for phytoextraction of Co, Cu, Zn and capability of desalination of saline soil, International Journal of Environmental Science and Technology, 19 (2022) 2737-2746.

[86] M. Waris, J.A. Baig, F.N. Talpur, T.G. Kazi, H.I. Afridi, An environmental field assessment of soil quality and phytoremediation of toxic metals from saline soil by selected halophytes, Journal of Environmental Health Science and Engineering, 20 (2022) 535-544.

[87] N. Yenil, F. Yemiş, İ. Sabikoglu, N. Memon, A. Güler, Comparative Analyses of Few West Turkish Varieties of Pomegranate (Punica granatum L.) Peels for Phenolic Content Using Liquid Chromatography, Polycyclic Aromatic Compounds, (2022) 1-17.

List of Book Chapters Published During 2022

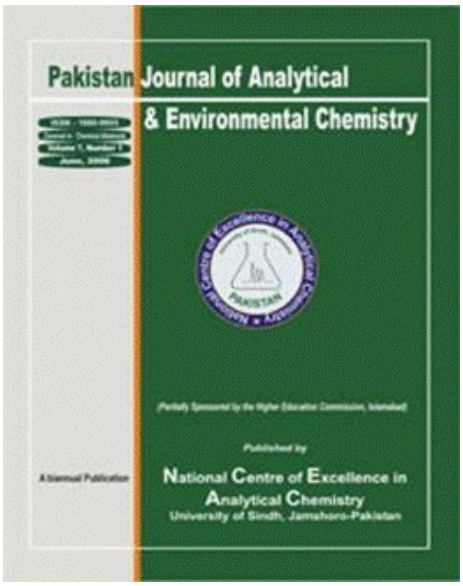
1.	Fayyaz Salih Hussain, Najma Memon, Nilgün Yenil , Fadim Yemiş and Tahir Mehmood "Authenticity and chemometrics of nuts" in "Chemometrics and Authenticity of Foods of Plant Origin", CRC Press (submitted) 2022
2.	Imran Rind, Najma Memon, et. al "Biochar-based composites for removal of heavy metal ions" in "Biochar-based Composites: Recent Advances in Production and Applications" Springer Nature (2022)
3.	Sidra Khan, Afroz Gul, Fayyaz Salih Hussain, Saima Q Memon, Najma Memon, "Fenton-like processes in Dye Removal" in "Perspectives on Advanced Oxidation Processes in Dye Wastewater. Springer Nature (2022)
4.	"Biochar for electrochemical energy storage" in 'Biochar a Sustainable Approach: Recent Advances in Production and Applications', Najma Memon, Naveed Abro and Bakhtiar Samejo, Springer Nature (2022)
5.	Fayyaz Salih Hussain and Najma Memon, "Recent Advances in extraction of keratin from Industrial waste" in "Extraction of Natural Products from Agro-Industrial Wastes: A Green and Sustainable Approach", (2022)
6.	A.H. Kori, S. A. Mahesar, S. T. H. Sherazi, Z.H. Laghari, A. A. Otho. *Non Food Applications of Coriander*, in: M.F. Ramadan (Eds), Handbook of Coriander (*Coriandrum sativum*): Chemistry, Functionality and Applicantions, Taylor and Francis Publishers. 2022.
7.	S. A. Mahesar, M.S. Jagirani, A.R. Khaskheli, A. Balouch, S.T.H. Sherazi. *Green Synthesis of Nanoparticles from Coriander Extracts*, in: M.F. Ramadan (Eds), Handbook of Coriander (*Coriandrum sativum*): Chemistry, Functionality and Applications, Taylor and Francis Publishers. 2022, Chapter 27, Pages 349-365. DOI: 10.1201/9781003204626-29
8.	S. A. Mahesar, H. S. Shaikh, A.R. Khaskheli, S. T. H. Sherazi, A.H. Kori, N. A. Malghani, Fig Minerals, in: M.F. Ramadan (Eds), Fig (Ficus carica): Production, Processing, and Properties, Springer Nature Publishers. 2022, Chapter 20, Pages 465-475.

JOURNALS PUBLISHED DURING 2022

PAKISTAN JOURNAL OF ANALYTICAL & ENVIRONMENTAL CHEMISTRY

Volume 23 No. 1 2022 & Volume 23 No. 2 2022

Two issues of the **Pakistan Journal of Analytical and Environmental Chemistry** had been brought in time. The copies of the journal were issued to all Universities and R&D organizations in the country and few abroad.



Available on line: http://www.pjaec.pk/index.php/pjaec

Directory of World Open Access Journals

LIST OF EVENTS ORGANIZED BY CENTER DURING 2022

1. One Day Training Workshop on "Computer Skill in Office Management" on January 27, 2022 in the National Centre of Excellence in Analytical Chemistry, University of Sindh, Jamshoro. The 'Resource Person' was Prof. Dr. Shahzad Ahmed Memon, Director of Research & Graduate Studies, Institute of Information and Communication Technology University of Sindh, Jamshoro.
2. "Lecture Series" of Eminent Scientists organised by National Center of Excellence in Analytical Chemistry.

   A comprehensive lecture on "Role of Science and Technology to Facilitate the Society" was delivered by Prof. Dr. Iqbal Chohadry, Director ICCBS, HEJ, Karachi University at Senate Hall, University of Sindh, Jamshoro, Pakistan on 25th February 2022
3. Co-Organizer of 2nd International Conference Disaster Risk Management and Human Health, Virtual, 18-19 June 2022. Organized by Lincoln University College, Malaysia.

LIST OF EVENTS ATTENDED BY CENTER DURING 2022

1. **Flashback of career in Science**

   Prof. Dr.Najma Memon attended "Flashback of career in Science", Online seminar on 'Star Scientist and Technology Transfer from University to Industry', 12 January 2022. Organized by MUET.pk and GRIPS, Japan

2. **6th International Conference on Energy, Environment and Sustainable Development,**

   Prof. Dr. Najma Memon, delivered a talk on "Characterization and Capacitive Performance Assessment of Potato Peels derived salt-induced porous Carbons", 6th International Conference on Energy, Environment and Sustainable Development, 17-19 January 2022 at MUET, Jamshoro.

3. **Kromatografi XX (Hybrid)**

   Prof. Dr. Syed Tufail Hussain Sherazi, Prof. Dr. Shahabuddin Memon, Dr. Farah Naz Talpur and Dr. Huma Shaikh delivered invited lectures (online) in Kromatografi XX conference during 24-25th February 2022, Organized by Hacettape University, Department of Chemistry, Anakara, Turkey.

4. **International Conference on Environmental Sustainability**

   Prof. Dr. Tufail Hussain Sherazi delivered a lecture on "Sustainable Strategy to Control the Land Pollution" at International Conference on Environmental Sustainability organized by US-Pakistan Center for Advanced Studies in Water, Mehran University of Engineering and Technology, Jamshoro, Pakistan during March 3-4, 2022.

5. **HEC-BC Research Capacity Building Program for Principal Investigators (PIs)**

   Prof. Dr. Tufail Hussain Sherazi and Dr. Ayaz Ali Memon attended Five days Training Workshop Organized by World Bank, British Council and HEC, Pakistan at Marriot Hotel, Islamabad, Pakistan during 7-11 March 2022.

6. **2nd European Sample Preparation e-Conference (EuChemS 2022 Online Event)**

   Dr. Sarfaraz Ahmed Mahesar participated in the mentioned event during March 14-16, 2022.

7. **National Conference on Chemical Sciences: A Multidisciplinary Approach (ICCS-MA)-2022**

Prof. Dr. Tufail Hussain Sherazi, Prof. Dr. Shahabuddin Memon and Prof. Dr. Amber Rehana Solangi delivered Invited lectures at "National Conference on Chemical Sciences: A Multidisciplinary Approach (ICCS-MA)-2022" held on 29-31 March 2022 at Shah Abdul Latif University (SALU), Khairpur Mir's, Sindh-Pakistan.

8. **Empowering Women for Leadership**

   Prof. Dr. Najma Memon attended "Empowering Women for Leadership" Training Course, 9-13 May 2022 Organized by National Academy of Higher Education, Islamabad at Islamabad.

9. **International Training Course on "Environmental Toxicology and Health**

   Prof. Dr. Amber Rehana Solangi attended International Training Course on "Environmental Toxicology and Health" from June 15 – 20, 2022 Organized by Chulabhorn Research Institute, Bangkok, Thailand.

10. **Joint Research and Training Program of PC-1 entitled Establishment of a Center for Advanced Technologies in Biomedical Materials**

    Dr. Ayaz Ali Memon attended Joint Research and Training Program of PC-1 entitled Establishment of a Center for Advanced Technologies in Biomedical Materials. COMSATS University Islamabad, Lahore Campus.

11. **International Conference on Research Advancement in Chemistry (ICRA-C 2022)**

    Prof. Dr. Syed Tufail Hussain Sherazi delivered a lecture on "Function of Capping Agent for the Colorimetric Sensing of Different Materials Using Metal Nanoparticles" at International Conference on Research Advancement in Chemistry (ICRA-C 2022) held on August 24-25, 2022.

12. **9th IUPAC International Conference on Green Chemistry**

    Prof. Dr. Amber Rehana Solangi participated in 9th IUPAC International Conference on Green Chemistry" from 5-9 September, 2022 being held at Athens, Greece (attended online)

13. **Meeting to enhance research collaboration and Laboratory Training Course on Micro- Nano-Material Characterization Techniques**

    Dr. Aamna Baloch attended the meeting to enhance research collaboration and Laboratory Training Course on Micro- Nano-Material Characterization Techniques,

Department of Physics Engineering Istanbul Technical University, Istanbul, Turkey from 22th August – 23rd Sept 2022.

14. **6th International Conference on Sustainability in Process Industry-2022**

    Prof. Dr. Najma Memon Participated in the 6th International Conference on Sustainability in Process Industry-2022 held on 19-20 October 2022. Organized by UET-Peshawar and GIKI, Swabi

15. **20th International & 32nd National Chemistry Conference on "Chemical Sciences and Sustainable Development Goals"**

    Prof. Dr. Tufail Hussain Sherazi, Prof. Dr. Farah Naz Talpur, Dr. Hassan Imran Afridi, Dr. Sarfaraz Ahmed Mahesar, Dr. Aamna Baloch, Dr. Jamil Ahmed Baig and Dr. Ayaz Memon along with research scholars of NCEAC participated in 20th International & 32nd National Chemistry Conference on "Chemical Sciences and Sustainable Development Goals" held on November 02-04, 2022 at Khwaja Fareed University of Engineering & Information Technology (KFUEIT) Rahim Yar Khan, Pakistan. Prof. Dr. Tufail Hussain Sherazi delivered Plenary Lecture, rest of the faculty delivered invited lectures and students present their research as Posters. One of the M.Phil Scholars Mr. Masood Rehman won 3rd Prize in Poster Presentation Competition.

16. **Food Science and Technology**

    Prof. Dr. Najma Memon, participated in Conference on “Food Science and Technology”, held on 17 November 2022 at the Department of Chemical Engineering, MUET, Jamshoro.

17. **International Workshop on “Leveraging Innovations for Infrastructure Development and Sustainable Industrialization**

    Prof. Dr. Syed Tufail Hussain Sherazi delivered a lecture on “Impact of Covid-19 and Recent Flood on Industry, Innovation and Infrastructure of Pakistan” at International Workshop on “Leveraging Innovations for Infrastructure Development and Sustainable Industrializationheld on November 17-18, 2022.

18. **Sensor E-Con 2022**

    Prof. Dr. Syed Tufail Hussain Sherazi delivered a lecture on “Colorimetric Sensing of Some Environmental Hazard Substances by Metal Nanoparticles” in Sensor E-Con 2022 held on November 21-22, 2022.

19. **Joint Research and Training Program of PC-1 entitled "Establishment of a Center for Advanced Technologies in Biomedical Materials"**

    Dr. Ayaz Memon attended the said training at COMSATS University Islamabad, Lahore Campus

20. **HEC-BC PIs Research Capacity building program for PIs.**

    Dr. Ayaz Memom attended the said training during March 7-11, 2022 in Hotel Marriott, Islamabad. Organized by: Pak-UK Education Gateway collaborative Project (Higher Education Commission with the British Council).

MEETINGS HELD DURING 2022

1. Meeting of Academic Committee was held on 14th March 2022. In this meeting focused Area of Research, Budget utilization 2021-2022, preparation of PC-1, Projects- National and International, Planning of Conferences, Seminar and Workshops were discussed.
2. Meeting of Financial Planning Committee was held on 18th March 2022. In this meeting budget utilization and budget preparation for the financial year 2022-23 were discussed.
3. Meeting of Board of Governors was held on 5h June 2022. In this meeting several academic and administrative matters were discussed.
4. Meeting of Academic Committee was held on October 24th, 2022. In this meeting National and International Reviewers list for evaluation of M.Phil and Ph.D thesis was updated. The organization of International Conference in the academic year 2023 was also finalized in this meeting.
5. Meeting of Financial Planning Committee was held on 22nd November 2022. In this meeting budget utilization and budget preparation for the financial year 2022-23 and 2023-24, respectively were discussed.
6. Meeting Departmental Promotion Committee was held on 28th November 2022. In this meeting committee members reviewed the applications of promotions of different staff and approved the promotions as per rules.
7. Meeting of Board of Governors will be held on 16th December 2022. In this meeting several academic and administrative matters will be discussed.

LIST OF RESEARCH GRANTS

- **Research Projects Accepted for Funding**

1. Research project on "Fabrication of Lipid Derived Silver Nanostructures for Antioxidant and Antimicrobial Potential" is accepted by Sindh Higher Education Commission. The total cost of project is Rs. 2.26 million. P.I. Prof. Dr. Tufail Hussain Sherazi (2022-2024).

- **Ongoing Funded Research Projects**

1. Research project on "Development of Sustainable and Scalable Antiviral Fabric coatings" is accepted by Sindh Higher Education Commission. The total cost of project is Rs. 3.58 million. P.I. Prof. Dr. Najma Memon (2021-2023).
2. Research project on "Coloration of polyester fabric at room temperature using advanced structure color technique: A practical approach towards green environment and energy saving" is accepted under Local Challenge Fund/Higher Education Development in Pakistan (LCF-HEDP) through HEC Pakistan. The total cost of project is Rs. 20.043 million. P.I. Dr. Ayaz Memon (2021-2023).
3. Research project on "Development and Upscaling of Combined Adsorption Distillation Technique for Saline-Water Treatment and Fresh Water Production on Industrial-Scale (CAD-WATER)" is accepted under TTFG- Higher Education Commission of Pakistan by HEC Pakistan. The total cost of the project is 13.5 million. P.I. Tanveer Hussain, Co P.
4. Research project on "Synthesis and applications of calixarene based nanofibers" accepted Under NRPU, Higher Education Commission. The total cost of the project is Rs. 4.97 millions.PI Prof. Dr. Shahabuddin Memon, Co-PI Dr. Huma Ishaque (2019-2023).
5. Research project on "Synthesis of graphene based polymeric nanocomposite and their applications as sensing materials" accepted Under NRPU, Higher Education Commission. The total cost of the project is Rs. 3.65 millions.PI Dr. Huma Ishaque, Co-PI Prof. Dr. Sirajuddin (2019-2023).

- **Completed Funded Research Projects**

  Research project on "Exploitation of Role of Capillary Electrophoresis as a Characterization Tool for Nanomaterials" awarded by NRPU, Higher Education Commission. The total cost of the project is Rs. 1.5 millions. PI Prof. Dr. Amber Rehana Solangi.

- **Research Grants Applied**

1. Research Project on "Development of Membrane based Oxygen and Nitrogen Generator/Concentrator" was submitted to National Technology Innovation Fund & Pakistan Science Foundation by Dr. Huma Muddasar. The total cost of the project was 1.4 million.
2. Research Project on "Development of low-cost analytical sensors to assess the quality of air and surface water and fabrication of filter membranes for the environmental remediation." was submitted to HEC under COE grants by Prof. Dr. Tufail Hussain Sherazi and Dr. Huma Muddasar. The total cost of the project was 8.4 million.
3. Research Project on "Impact of chemotherapy and radiotherapy on the level of essential and toxic elements of biological samples of different types of cancer patients" was submitted to HEC under COE grants by Prof. Dr. Tufail Hussain Sherazi and Dr. Hassan Imran Afridi. The total cost of the project was 8.1 million.

LIST OF PATENTS/HONOURS AND AWARDS

- ***Patents Applied***

  Total 4 Patents were applied from this Center in the year 2022

- ***Awards Applied***

  Dr. Hassan Imran Afridi was nominated by Higher Education Commission for the UNESCO-EQUATORIAL GUINEA INTERNATIONAL PRIZE FOR RESEARCH INLIFE SCIENCES 2022.

LIST OF COLLABORATIONS

National Academic Collaborations

1. Department of Textile Engineering, MUET, Pakistan
2. Chemical Sciences Department of Chemistry, University of Sargodha, Sargodha.
3. Faculty of Sciences, Department of Chemistry and Biochemistry University of Agriculture, Faisalabad
4. National Center of Excellence in Physical Chemistry, University of Peshawar, KPK
5. UET, Peshawar.
6. School of Chemical and Materials Engineering (SCME), National University of Sciences & Technology, Islamabad, Pakistan
7. H.E.J. Research Institute of Chemistry, International Centre for Chemical and Biological Sciences (ICCBS), University of Karachi, Karachi-75270, Sindh, Pakistan.
8. Department of Chemistry, University of Karachi, Karachi-75270, Sindh, Pakistan.
9. Department of Physics, COMSATS University Islamabad, Lahore Campus, 54000, Pakistan

International Academic Collaborations

1. Environmental Engineering Department, Zhejiang University; China.
2. Department of Chemistry, Selcuk University, Konya; Turkey.
3. Faculty of Science and Art, Erciyes University, Kayseri, Turkey.
4. Faculty of Agricultural and Environmental Science,Department of Food Science & Agricultural Chemistry,Macdonald Campus of McGill University, Canada.
5. Faculty of Science, Department of Chemistry, Karamanoğlu Mehmetbey University, Karaman; Turkey.
6. Department of Chemistry, WFU, USA
7. USPCAS-W, MUET, Pakistan
8. UNIMAS, Malaysia
9. Celal Bayar University, Turkey
10. Ankara University, Ankara, Turkey
11. Istanbul Technical University, Istanbul, Turkey
12. Hacettepe University, Ankara, Turkey
13. UNESCO Laboratory of Environmental Electrochemistry, Charles University, Prague, Czech Republic.